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THE CROWN SPARROWS (ZONOTRICHIA) OF THE MIDDLE WEST

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With Colored Frontispiece by Iva B. Swenk

The genus *Zonotrichia* is a purely North and Middle American genus of sparrows. According to the third edition of the A. O. U. Check-List (1910) it includes four species; viz., the Harris's Sparrow (*Z. querula*), the White-crowned Sparrow (*Z. leucophrys*), the Golden-crowned Sparrow (*Z. coronata*), and the White-throated Sparrow (*Z. albicollis*). The Harris's, Golden-crowned, and White-throated Sparrows are all very well-marked species, presenting so little geographic variation that no ornithologist has ever proposed any subspecific division of them. Their breeding ranges are distinct and solid, that of the Harris's Sparrow (Hudsonian Zone) apparently lying entirely north of the breeding range of the White-throated Sparrow (lower Hudsonian and Canadian Zones) and that of the Golden-crowned Sparrow (Hudsonian and Upper Canadian Zones) entirely west of it. The Golden-crowned Sparrow is a purely accidental straggler to the Middle West, so this paper does not concern itself with that species. The breeding range of the White-throated Sparrow extends south to northern Michigan, Wisconsin, Minnesota, and North Dakota, and it migrates commonly through the Middle West, wintering from the Ohio River Valley, northern Missouri, and eastern Kansas southward.

In marked contrast to the three species just mentioned, the White-crowned Sparrow of the last (1910) A. O. U. Check-List would seem to present considerable geographic variation. That authority recognizes a typical subspecies, the White-crowned Sparrow (*Z. l. leucophrys*), as occupying during the breeding season not only a large area in northeastern North America (Hudsonian and extreme Upper Canadian Zones) but several apparently isolated areas in the high mountains of the western United States, extending north in the Rocky Mountains to southwestern Alberta and southeastern British Columbia; a northwestern subspecies, the Gambel's Sparrow (*Z. l. gambeli*), as

occupying a large area (in the same zones) covering most of Alaska and western Canada, extending south in the Rocky Mountains to western Montana; and a Pacific coast subspecies, the Nuttall's Sparrow (*Z. l. nuttalli*), as occupying a narrow area along the coast (Humid Transition Zone) from southern British Columbia to central California.

Recently, Dr. Joseph Grinnell (1928) has proposed to separate the somewhat paler colored, more northern examples of *Z. l. nuttalli* occupying the coast region from southern British Columbia to extreme northwestern California as a distinct subspecies, *Z. l. pugetensis*, restricting typical *nuttalli* to the coast area of California. Since neither *nuttalli* nor *pugetensis* extends to the Middle West, they and the problems they present are not importantly involved in the present paper, but the White-crowned Sparrow and the Gambel's Sparrow, both of which are common migrants through this region, do present a problem of considerable interest to the ornithologists of the interior. A leading question in the mind of the writer at this moment is, does the treatment accorded these birds in the last (third) edition of the A. O. U. Check-List, which has been very recently endorsed by Dr. Grinnell (1928), and which the writer understands is likely to be continued in the forthcoming fourth edition of the Check-List, accord best with the known facts concerning them?

The diverse and varying opinions of our leading systematic ornithologists as to the correct relationship of the Gambel's Sparrow to the White-crowned Sparrow have caused the taxonomic placement of the former to be shifted several times since it was first described—as a distinct species—by Thomas Nuttall in 1840, from specimens taken the last of August at Fort Walla Walla, Washington. Authors subsequent to Nuttall, between 1840 and 1872, including Gambel (1843), Baird (1858), Coues (1866), and others, continued to regard the paler birds of the West as constituting a distinct species from the black-lored *Z. leucophrys*. In 1872 both Allen and Coues for the first time formally questioned the specific distinctness of *gambeli* from *leucophrys*, and wrote the former as a variety of the latter, Coues including also the Nuttall's Sparrow under the name "*var. gambelii*".

Then in 1873 Ridgway, recognizing the difference between the larger and paler white-lored bird now known as the Gambel's Sparrow and the smaller and darker white-lored bird of the Pacific Coast now known as the Nuttall's Sparrow, but erroneously thinking that the name "*gambelii*" of Nuttall applied to the latter form, proposed the name *intermedia* (=Intermediate Sparrow) for the former bird, and at the same time continued to give both birds the status of varieties of

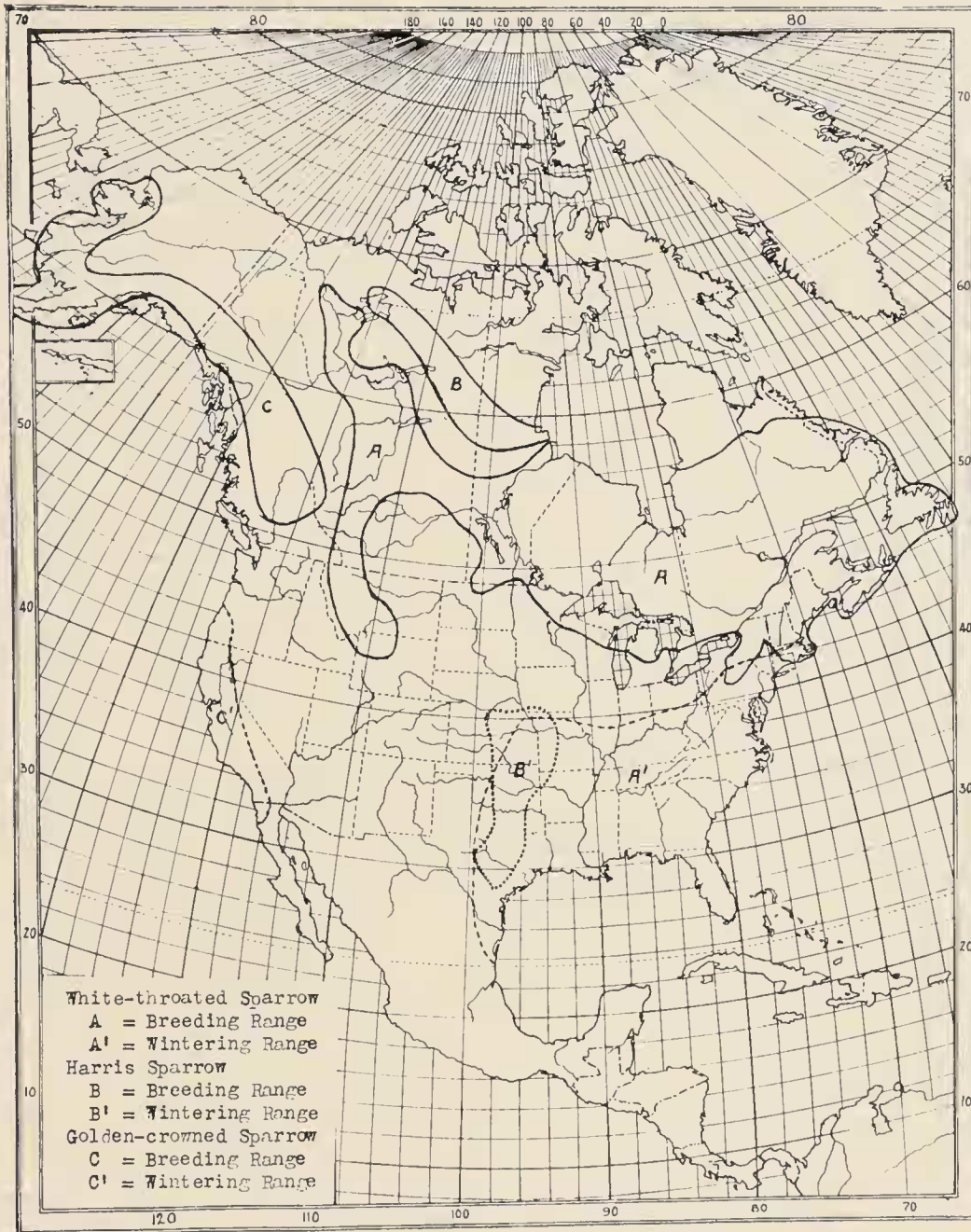


FIG. 1. Map showing approximate breeding and wintering ranges of the White-throated, Harris's, and Golden-crowned Sparrows.

the White-crowned Sparrow. In this disposal of them he was followed by Baird, Brewer, and Ridgway (1874), Coues (1874), and others. But some authors continued to regard both *intermedia* and the Pacific Coast form wrongly called "*gambelii*" as full species, and that was the disposal made of them in the first A. O. U. Check-List when it appeared in 1886 (Nos. 555 and 556).

However, a number of writers failed to follow the A. O. U. Check-List in this matter, but wrote both *intermedia* and "*gambelii*" as subspecies of *leucophrys*. Still others, again following the lead of Ridgway (1880), wrote *intermedia* as a subspecies of the Nuttall's Sparrow, which was still regarded as the true *gambeli*. In 1890, in the second supplement to the Check-List, the A. O. U. Committee made "*gambelii*" a subspecies of *leucophrys*, and similar action was taken with both *intermedia* (554a) and "*gambelii*" (554b) in the second edition of the A. O. U. Check-List, which appeared in 1895. Somewhat later Ridgway (1899), having examined specimens from the type locality of "*gambelii*", reported that he found them to represent the form that he had previously named *intermedia*, which name therefore became a synonym of *gambeli*, while the new name *nuttalli* (=Nuttall's Sparrow) was proposed for the Pacific Coast bird that had so long been miscalled "*gambelii*". This is the present status of these birds, as recognized by the A. O. U. Committee.

The commonly accepted criteria of subspecies, as the writer understands them, are that during the breeding season they shall occupy geographically separated areas within the range of the species as a whole, and that their differentiating characters shall intergrade with each other, either by so gradual a transition, or by so much overlapping of characters, that no point of trenchant separation of the two forms can be found. The question arises, how do the White-crowned and the Gambel's Sparrows align with regard to these criteria?

Regarding the occupancy of geographically separated breeding areas, we have the evidence presented by J. H. Riley, who in 1913 pointed out that in the Mount Robson, British Columbia, region of the Canadian Rockies both *leucophrys* and *gambeli* were apparently nesting at the same places and without intergradation. In 1914, Saunders reported that apparently both *leucophrys* and *gambeli* were summer residents in the mountains of Teton and northern Lewis and Clarke Counties in northwestern Montana, and that there was evidently a distinct difference in their songs. In 1926 Swarth clearly showed the overlapping of the breeding ranges of *leucophrys* and *gambeli* in southeastern British Columbia, southwestern Alberta and

northwestern Montana, and again pointed out the lack of intergradation between the two forms, which he wrote as distinct species. Quite evidently, then, while the breeding range of *leucophrys* extends northward in the Rocky Mountains through western Montana and on north along the Alberta-British Columbia boundary, that of *gambeli* extends southward over the same area. We have, therefore, these two forms occupying the same territory over a large area within their respective breeding ranges, a condition that is incompatible with the conception of their status as subspecies.

Now regarding the matter of intergradation between *leucophrys* and *gambeli*. Do they gradually merge into each other, or do birds occur that are intermediate in characters between the two? Admittedly they are very close—about the only important difference being that in the White-crowned Sparrow the upper lores are black and cut the white superciliary stripe from the bill, while in the Gambel's Sparrow the upper lores are whitish, thus making the white superciliary stripe continuous to the bill. But this difference, though slight, is definite and trenchant. In fact, partly because of their unsuspecting nature, these sparrows can usually be approached quite closely in the field, and with the help of a good field glass the ornithologist can quickly and definitely identify the Gambel's Sparrow from the White-crowned Sparrow in the great majority of cases. The writer has not examined a great number of skins of these two sparrows—probably less than fifty of them altogether—but he has never seen one that could not very definitely be placed as either *leucophrys* or *gambeli*, while the large number of birds that he has clearly seen in the field were placed quite as definitely. On this point Swarth (1926) has written:

“I am using the binomial name for this bird in the conviction that the three white-crowned sparrows, *leucophrys*, *gambelii*, and *nutalli* are three distinct species. There are various trenchant external characters of plumage and other parts distinguishing them, there are just as notable differences of song, and the breeding ranges and migration routes also are indicative of specific differences. As regards external characters, while I am aware that there are various published statements of the existence of intergradation between these forms, these assertions are all rather vague. In this museum [of Vertebrate Zoology] there are approximately 200 specimens of *leucophrys*, 270 of *gambelii*, and 200 of *nutalli*. There is not one equivocal specimen in this series, not one that can be said to illustrate in even the slightest degree intergradation between any of the forms. Nor have I seen

intermediates in other collections. If any such do sporadically occur it seems to me that they should be regarded as hybrids rather than geographic intergrades.”

Dr. Grinnell (1928) subsequently took issue with Swarth on his statement that the three forms *leucophrys*, *gambeli*, and *nuttalli* were trenchantly separated, and that in a series of about 670 specimens representing these forms “not one can be said to illustrate in even the slightest degree intergradation between any of the forms”, stating that he was able to find specimens from among the birds inhabiting the northern part of the range of *nuttalli*—to which he applied the new subspecific name *pugetensis*—that were intermediate in characters between *gambeli* and typical *nuttalli* from west-central California. But although he regarded *gambeli*, *pugetensis*, and *nuttalli* all as subspecies of *leucophrys*, Grinnell made no claim of finding intermediate characters or intergradation between *leucophrys* and *gambeli*, and his arguments would not seem to invalidate the findings of Riley and Swarth on that point. Possibly *gambeli*, *pugetensis*, and *nuttalli* may be conspecific, but it seems to the writer that the best evidence points to their collective specific distinctness from the White-crowned Sparrow (*leucophrys*), and in view of this evidence he sees no logical alternative to so regarding them.

A search through the literature for citations of evidences of actual subspecific intergradation between *leucophrys* and *gambeli* has been rather barren of results. As Swarth (1926) has said, assertions of this sort are “all rather vague”, and one is rather drawn to the conclusion that such intergradation has been assumed because of the great similarity of the two birds, rather than actually demonstrated. Baird, Brewer, and Ridgway (1874) do refer to intergrades from the Humboldt Mountains, Nevada, but they do not make very clear the nature of the intergradation. Coues (1905) says “some specimens resemble *leucophrys* on one side of the head, and *intermedia* (= *gambelii*) on the other.” That is at least a definite statement; but, as Swarth has suggested, if such birds occur they are far better accounted for on the basis of hybridity than on the basis of gradual subspecific intergradation. It seems probable to the writer that it is the great general similarity between *leucophrys* and *gambeli* that has mainly argued for their specific merging. As Grinnell (1928) puts it “there is that approximate degree of uniformity of characters in the three major forms (*leucophrys*, *gambelii*, and *nuttalli*) as to make of them excellent subspecies; but the likenesses between them are so outstanding, as compared with other species of *Zonotrichia* (*albicollis*, *coronata*, *querula*),

that an indication of the really close mutual inter-relations among them would be lost by according the forms of *leucophrys* full specific rank." With this conclusion, however, the writer does not concur. On the same basis we would have to merge the Meadowlark and the Western Meadowlark, the Clay-colored and the Brewer's Sparrow, and others. As well write the Least Flycatcher (*Empidonax minimus*) as a subspecies of the Traill's Flycatcher (*E. trailli*), in spite of their differences in song, eggs, etc., because the two have a marked uniformity of characters and outstanding likenesses. They are in fact much more difficult to separate than are the White-crowned and Gambel's Sparrows.

The difference in song between the White-crowned and Gambel's Sparrows has been noted by Saunders (1914 and 1929), Swarth (1926), and others, but it is not a point upon which the writer would lay a great deal of emphasis as indicating the specific distinctness of the birds. This is because their songs, especially those of the White-crowned, seem to be subject to considerable geographic variation. The song of the white-crowns of the Northeast consists typically of a soft, plaintive, clearly whistled introductory note, followed by a couplet of louder but shorter clearly whistled notes, which in turn are followed by a second couplet or triplet of rapidly diminishing, burred-toned notes and a final still more diminished, usually burred note, and may be given as "oh-che-che, che-che, che" or — — — — —. In northern Montana, from Mrs. Bailey's (1918) description, this song is apparently lengthened to an eight-toned song, that might be given as "oh, che-che-che, che-che-che, che", or — — — — — — — —, and in the Sierra Nevada, according to the same writer (1902), is shortened to a five-toned song which might be given as "oh, oh, che-che-che", or — — — — —. The typical full song of the Gambel's Sparrow consists of a clearly whistled introductory note, followed by from three to five usually shorter, plaintive, clearly whistled notes and a final burred note, that may be given as "oh, che-che-che-che-e", or — — — — —. Saunders (1914) says of the songs of both in their common breeding ground in northwestern Montana that "the song which evidently belongs to *gambelii* is like that of *leucophrys* but shorter, with three or four of the terminal notes omitted. I have never heard any but the longer song in southern Montana, where I believe only *leucophrys* breeds." But it is doubtful if the northern Montana song of *gambelii* is appreciably shorter than the Sierra song of *leucophrys*, or even that of the Northeastern song of that bird. However, the songs of the two differ, as judged from migrating birds of both species heard in

Nebraska, and from the songs of *gambeli* heard during the spring in southern Arizona, in the clearer, less husky quality of all of the notes beyond the introductory one in *gambeli*, which also has a less sharply marked crescendo and diminuendo in its song.

Not only are the breeding ranges of the White-crowned and Gambel's Sparrows well defined, though in part overlapping, but the same is true of the wintering ranges of the two birds. The White-crowned Sparrows of northeastern North America move southwest across the New England, North Atlantic, and North Central States to their wintering range, which extends from the valleys of the Potomac and Ohio Rivers and southern Missouri, Kansas, and Colorado south to southeastern Kentucky, eastern Tennessee, southern Mississippi, Louisiana, and Texas, and central Mexico (about lat. 19°). The white-crowns of the higher mountains of the West move more directly south. The Gambel's Sparrows move south, along the valleys of the West and across the Great Plains, to a wintering range lying in general somewhat north and west of that of the White-crowned Sparrows, from southern Washington, western Oregon, western and southeastern California, central Arizona, western New Mexico, central Colorado, central Kansas, and west-central Missouri south to south-central Texas, north-central Mexico (about lat. 24°), and southern Lower California. The two species winter, then, in the same localities, over a large area covering southern Colorado, southern Kansas, west-central Missouri, Oklahoma, central and western Texas, New Mexico, and northern Mexico. These birds apparently largely pass over the northern plains—eastern Colorado, Wyoming and Montana, the Dakotas, Nebraska, Iowa, and Minnesota—each spring and fall, the White-crowned in the spring from southwest to northeast and the Gambel's from southeast to northwest, and the reverse in the fall. Nebraska is in the direct path of the migration of both.

In Nebraska the White-crowned Sparrow is a common migrant, especially in the spring, west to about the 98th meridian, but west of that line it rapidly becomes increasingly less common across the state, though it is hardly a rare bird even in extreme western Nebraska. The Gambel's Sparrow is a very common migrant over the western two-thirds of Nebraska and even in the eastern one-third is distinctly more common than the White-crowned Sparrow. Westwardly in Nebraska the Gambel's Sparrow greatly predominates over the White-crowned. In 1920 Dawson found Gambel's Sparrows migrating commonly through Sioux County, extreme northwestern Nebraska, from September 26 to October 9, but noted only one White-crowned Spar-

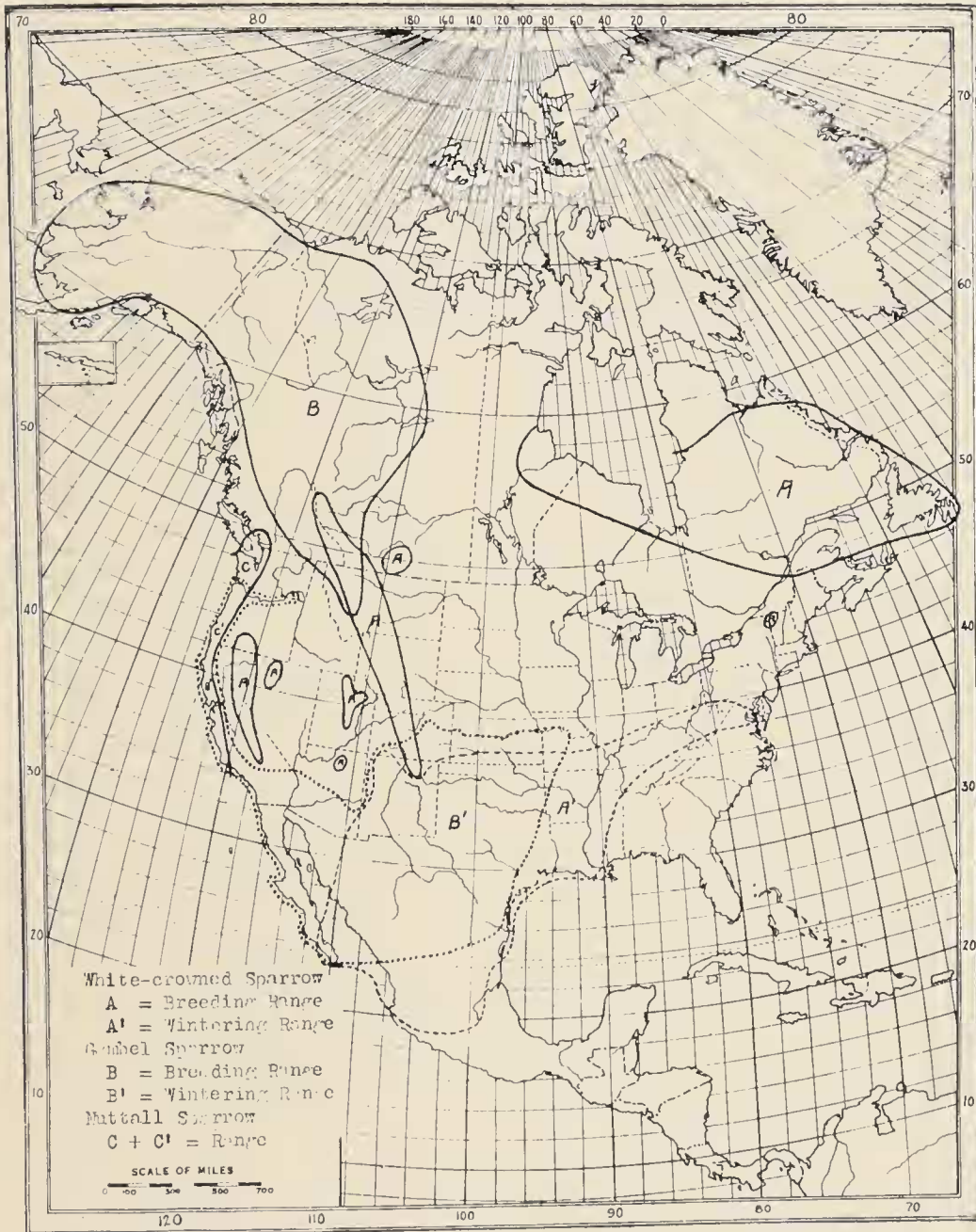


FIG. 2. Map showing approximate breeding and wintering ranges of the White-crowned, Gambel's, and Nuttall's Sparrows. Breeding ranges taken from H. S. Swarth, Univ. Calif. Publ. Zool., 30, fig. J (1926).

row during this period (on September 30). At Kearney, Buffalo County, in central Nebraska, the Gambel's Sparrow is distinctly the more common of the two. Four out of five crown sparrows taken there in the spring of 1914 (April 23 to May 20) were Gambel's Sparrows. Similarly, the Gambel's outnumbers the White-crowned at Hastings, Adams County; Red Cloud, Webster County, and Superior, Nuckolls County. Of thirty-three crown sparrows trapped at Fairbury, Jefferson County, in the years 1924 to 1928, inclusive, by the Misses Callaway, twenty-one were Gambel's Sparrows (April 29 to May 16) and twelve were White-crowned Sparrows (April 27 to May 21). At Lincoln, Lancaster County, taking 104 carefully made field observations, covering a period of years and including both spring and fall dates, the Gambel's Sparrow constitutes 59 per cent and the White-crowned Sparrow 41 per cent of the birds observed. In the spring the ratio of the two species at Lincoln is about as 5 to 3, while in the fall it is about as 2 to 1, the Gambel's Sparrow thus predominating at both seasons. The Gambel's Sparrow is about twenty-eight per cent as common in the fall as it is in the spring at Lincoln; the White-crowned Sparrow about twenty-one per cent.

The writer cannot help but believe that the paucity of records of the Gambel's Sparrow for at least the tier of states east of Nebraska is more due to a lack of careful discrimination of the birds seen in the field than an actual great rarity of that species, a suspicion strengthened by the very recent records of Zimmer and Gregory (1929) of specimens of this bird from Huron Mountain, Marquette County, Michigan, October 12, 1924; Beach, Lake County, Illinois, October 6, 1906; and Waukegan, Lake County, Illinois, May 14, 1922, found confused with the White-crowned Sparrow in Chicago collections. Other published records are from Minneapolis, Minnesota, October 5, 1873; May 17, 1878; May 6, 1879 (Roberts, 1879); Decatur County, Iowa, spring (Trippe, 1872); Forest City, Iowa, October 5, 1894; October 3, 1896 (Anderson, 1907); Racine, Wisconsin, April 20, 1871, by P. R. Hoy, and Madison, Wisconsin, May 17, 1919 (Taylor, 1920); and Jackson County, Missouri, February 25, 1917 (Harris, 1919). It is interesting to note that this sparrow has wandered east even to Ithaca, New York, April 30, 1898, by L. A. Fuertes (Eaton, 1914) and to Mount Pleasant, South Carolina, October 23, 1925 (Wayne, 1926).

The published statements regarding the relative migratory movements of the White-crowned and Gambel's Sparrows through the interior country are, at first examination, conflicting and confusing. For example, Cooke (1888) says that in the Mississippi Valley the Gam-

bel's arrives *after* the White-crowned in the fall and *follows* it northward in the spring. At Manhattan, Kansas, he says that in the fall of 1883 the first specimen of the Gambel's Sparrow was taken by Prof. D. E. Lantz on October 9, at least a week after the White-crowned had passed southward, while in the spring of 1884 the Gambel's Sparrow was first seen on May 7, which was eleven days later than the northward migration of the White-crowned. But for New Mexico he states (in Bailey, 1928) "there is no doubt but that *gambeli* moves north in the spring *earlier* than *leucophrys* and birds taken, May 1, 1904, at Rinconada (Surber), and noted, May 15, 1915, at State College (Merrill), probably represent nearly its final departure from the State." The White-crowned, he states "largely concludes its spring migration in May" but mentions several instances of its occurrence in New Mexico well into June (1-11). Again Sclater (1912) says for Colorado that the Gambel's Sparrow arrives "rather *earlier* than the White-crowned, very quickly passing on north to its breeding grounds." He says it arrives as early as September 8 in the fall and as early as March 18 (Pueblo) in the spring, reaching Colorado Springs about the last week in March, while the White-crowned does not reach that place until about the last week in April. In Boulder County, Betts (1913) gives the Gambel's Sparrow as arriving March 20 and the White-crowned as arriving April 24 to 28.

A close analysis of the available migration data for the two species in Nebraska, which state lies directly in the migration path of the birds wintering in eastern New Mexico, Texas, and Oklahoma, partially accounts for these apparently discrepant statements. The earliest fall migrants of both the Gambel's and the White-crowned Sparrows appear in extreme western Nebraska. Quite possibly these first fall arrivals come together from the common breeding area of the two species, only a few hundred miles to the northwest. At Mitchell, Scotts Bluff County, in 1916, C. E. Mickel and R. W. Dawson noted the first Gambel's Sparrow on September 8 and the first White-crowned Sparrow on September 9. But neither of them become common, even in western Nebraska, until after the middle of September (17 to 26), shortly after which they appear in central and eastern Nebraska also. In northeastern Nebraska Cary (1900) gave the fall dates at Neligh, Antelope County, for both as September 22 to November 1. The earliest dates for Lincoln are September 28, 1913, for the Gambel's, and September 28, 1893 for the White-crowned. The average of the first dates for the Gambel's Sparrow in ten falls in southeastern Nebraska is October 13 and for the White-crowned Sparrow in five

falls is October 3. The Gambel's remains until the average date of October 29 at Lincoln, where its latest date is November 6, 1910. The average date for the White-crowned for the same locality is October 23 and its latest date there (and for the state as well, except for one dubious winter record) is November 2, 1907. At Red Cloud, Webster County, C. S. Ludlow noted the Gambel's Sparrow on the late date of November 24, 1921. It is obvious that the Gambel's Sparrow tends to remain north of the 40th parallel later in the fall than does the White-crowned Sparrow, which retires the farther south for the winter period.

From the above it is apparent that during the fall migration of these birds through eastern Nebraska, the White-crowned Sparrow is distinctly the earlier of the two. In the spring migration both species are much more in evidence in Nebraska than in the fall, possibly because in the spring the bulk of them take a more direct route to their breeding grounds. This is especially true of the White-crowned. The earliest spring date on record for the Gambel's Sparrow is for Hastings, Adams County, March 31, 1925, and the average date in six springs in that locality is April 20. The earliest spring date for the White-crowned Sparrow at Hastings is April 9, 1925, and the average date in six springs is April 23. At Red Cloud, Webster County, both the Gambel's and White-crowned Sparrows first arrived in fourteen springs from April 23 to May 6, with the average (April 30) the same for both species. At Lincoln, dates of first arrival of the Gambel's Sparrow in eighteen springs are April 19, 1899 to May 10, 1924, and for the White-crowned Sparrow in sixteen springs are April 10, 1925 to May 10, 1924, the average date being May 1 in both cases. At Fairbury, Jefferson County, dates of first arrival in five springs are April 28, 1929 to May 8, 1925, averaging April 30, for the Gambel's, and April 16, 1928 to May 2, 1926, averaging April 24, for the White-crowned. These data show that in central Nebraska the vanguard of *gambeli* precedes *leucophrys* in the spring advance, while farther east in Nebraska the reverse is true.

Thus, between the plains bordering the foothills of the Rocky Mountains in Colorado, and eastern Nebraska, there is a great variation in the northward spring movement of the Gambel's and White-crowned Sparrows. In Colorado the Gambel's precedes the White-crowned by about four weeks; in central Nebraska it precedes by a few days; in eastern Nebraska it arrives at about the same time or a few days later than the White-crowned. In other words, as we proceed eastward from the main line of sharply northwestward migration of the Gambel's Sparrow, along the foothill plains, and it becomes

gradually less common, there is a slowing up of its northward movement, as compared to the White-crowned Sparrow, which moves both northwestward and northeastward on a broad front. The table at the end of this paper shows a similar slowing of the migration of the White-throated Sparrow from east to west. A slowing up of the northward movement of the Harris's Sparrow towards both the western and eastern peripheries of its regular migrational path is evident also from an analysis of the data on its migration presented by Swenk and Stevens (1929). This phenomenon is in fact observable in connection with the migration of many birds, and may be designated the *peripheral lag* of the migration movement.

The Gambel's Sparrow was last seen at Lincoln in four springs from May 13 to 18, an average date of May 15, while the White-crowned was last seen in five springs from May 11 to 18, an average date of May 14. The latest dates for the Gambel's are May 20, 1914, at Kearney (C. A. Black) and June 17, 1926, at Hastings (Mrs. C. W. McCaskill). The latest dates for the White-crowned are May 21, 1918, at Red Cloud (C. S. Ludlow), May 21, 1927, at Fairbury (Misses Callaway), June 9, 1919, at Kimball (Mickel and Dawson, 1920), and June 22 and 23, 1916, at Mitchell (do.). A study of all of the available data for several localities indicates that the range of dates of the spring migration for the Gambel's Sparrow is somewhat shorter than for the White-crowned, and that the migration reaches its crest somewhat more quickly. On the other hand, the bulk of the white-crown passes through somewhat more quickly than in the case of the Gambel's Sparrows.

Our four species of *Zonotrichia* move across eastern Nebraska in their migrations in a rather definite sequence. In the fall migration the White-crowned comes first, followed shortly by the White-throated and Harris's, the former preceding along the Missouri River, the latter farther west, and last of all arrives the Gambel's Sparrow. In the spring migration the Harris's Sparrow moves north first, during March. During the last week in April and the first few days in May the White-throated, White-crowned, and Gambel's move north, the White-throated preceding in eastern Nebraska, the Gambel's preceding in central and western Nebraska, the White-crowned slightly preceding the Gambel's in eastern Nebraska and slightly following it in western Nebraska. These relative movements of the four species may be shown in the following table of data, in which is given the number of years of observation and the average date first seen and average date last seen

for both the fall and spring migrations, in several Nebraska localities, for the Harris's, White-crowned, Gambel's, and White-throated Sparrows.

FALL MIGRATION

Harris's Sparrow

Sioux City:	19—Oct. 6	17—Nov. 11
Omaha:	6—Oct. 9	
Lincoln:	25—Oct. 7	12—Dec. 20
Fairbury:	4—Oct. 4	
Hastings:	4—Oct. 11	

White-crowned Sparrow

Sioux City:	9—Oct. 4	5—Oct. 15
Lincoln:	2—Oct. 2	6—Oct. 23
Fairbury:	3—Oct. 3	
Hastings:	1—Oct. 9	1—Oct. 16

Gambel's Sparrow

Lincoln:	9—Oct. 12	4—Oct. 29
Fairbury:	1—Oct. 17	1—Oct. 30

White-throated Sparrow

Sioux City:	11—Sept. 30	14—Oct. 25
Omaha:	3—Oct. 8	2—Oct. 30
Lincoln:	13—Oct. 8	11—Oct. 31
Fairbury:	5—Oct. 10	
Hastings:	5—Oct. 17	

SPRING MIGRATION

Harris's Sparrow

Hastings:	3—Mch. 14	
Red Cloud:	8—Mch. 21	
Fairbury:	2—Mch. 3	1—June 4
Lincoln:	20—Mch. 14	20—May 14
Omaha:	2—Mch. 20	6—May 10
Sioux City:	17—Mch. 29	21—May 17

White-crowned Sparrow

Hastings:	6—Apr. 23	1—June 17
Red Cloud:	14—Apr. 30	1—May 21
Fairbury:	5—Apr. 24	1—May 21
Lincoln:	16—May 1	5—May 14
Omaha:	5—May 3	1—May 14
Sioux City:	19—May 3	16—May 15

Gambel's Sparrow

Hastings:	6—Apr. 20	
Red Cloud:	15—Apr. 30	
Fairbury:	5—Apr. 30	
Lincoln:	18—May 1	4—May 15

White-throated Sparrow

Hastings:	6—May 2	1—May 18
Red Cloud:	11—May 2	1—May 13
Fairbury:	4—Apr. 23	1—May 15
Lincoln:	19—Apr. 25	16—May 11
Omaha:	5—Apr. 25	3—May 13
Sioux City:	21—Apr. 27	18—May 14

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STATUS OF GAMBEL'S SPARROW IN MICHIGAN

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One of the most interesting by-products of the bird-banding which has been carried on with ever increasing vigor in Michigan during the last ten years has been the great increase in our knowledge of the status of several of our rarer sparrows. Perhaps the most striking case is that of the Gambel's Sparrow (*Zonotrichia gambeli*) formerly unknown in the State and now found to be of regular occurrence. The credit for the discovery of the occurrence of this species in Michigan must go to a bird-bander, M. J. Magee. For, although his "specimen" was the fourth to be taken in the State, he was the first to differentiate it from the White-crowned Sparrow. When Magee wrote to the University of Michigan Museum in 1925 about his discovery, I examined the series of *Zonotrichia leucophrys* in the Museum collection and discovered the two Berrien County Gambel's Sparrows listed beyond. Gregory's specimen from Marquette County also passed as a White-crowned Sparrow until A. J. Van Rossem, happening to look through the Gregory collection, detected its true identity.

The known records of the Gambel's Sparrow in Michigan may be summarized as follows:

1918—May 6. Berrien County, Birchwood Beach. N. A. Wood, collector. No. 52252 Univ. of Mich. Museum of Zoology. Adult female.

1918—May 13. Berrien County, Birchwood Beach. N. A. Wood, collector. No. 52250 Univ. of Mich. Museum of Zoology. Adult male.